RESPONSE UNDER 37 C.F.R. § 1.116
EXPEDITED PROCEDURE
GROUP 1711
PATENT APPLICATION

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of

Toshikatsu FURUNAGA, et al.

Docket No: Q66716

Appln. No.: 09/982,770

Group Art Unit: 1711

Confirmation No.: 8733

Examiner: U. Rajguru

Filed: October 22, 2001

For: SIZING AGENT AND RECORDING PAPER COMPRISING SIZING AGENT

RESPONSE UNDER 37 C.F.R. § 1.116

MAIL STOP AF
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

Please consider the following Applicants' response to the outstanding final rejection of April 29, 2003.

Claims 17, 19 and 20 are pending.

Claims 17, 19 and 20 are rejected under 35 U.S.C. § 103(a) as being unpatentable over JP 10-119,425 (JP '425) in view of U.S. Patent 6,171,381 Yoshimura et al (Yoshimura).

The rejection of these claims is respectfully traversed. The Examiner's position is set forth in the Action in detail and will not be repeated here except as necessary to an understanding of Applicants' traversal which is now presented.

Since Applicants believe that the important features of the present invention are recited in claim 17, the patentability of claim 17 is discussed.

Claim 17 of the present application calls for: "A recording paper impregnated with a sizing agent comprising a water-soluble soybean polysaccharide and a cationic polymer".

Yoshimura disclose an aqueous metallic ink composition comprising at least a metallic powder pigment, a colorant, water and a water-soluble organic solvent, further including a natural polysaccharide, cellulose derivatives and/or a cyclodextrin or cyclodextrin derivatives, whereby the stability with time of the density of color development of an ink film is increased, and ink film fixibility to a nonabsorbent surface is improved (col. 2, lines 11-23).

Applicants respectfully submit that the Examiner's position regarding soybean polysaccharide as set forth in the Action at page 2, the first eight lines of the paragraph bridging pages 2/3 of the Action is incorrect. Specifically, the Examiner states:

"Yoshimura, therefore, suggest the use of (soybean) polysaccharide is very important with a material based on cellulose or cellulose derivative. Paper is one such material."

In this regard, it is important to appreciate that Yoshimura deals with an aqueous metallic ink composition. Yoshimura does not deal in any fashion with a recording paper which has been impregnated with a sizing agent comprising a water-soluble soybean polysaccharide and a cationic polymer. It is also important to understand the essential mechanism which is involved or proceeding in Yoshimura, as now explained. When the aqueous metallic ink composition in Yoshimura comprises both a natural polysaccharide (not a water-soluble soy polysaccharide or a water-soluble soy polysaccharide derivative, and also not including soybean polysaccharide) and cellulose derivatives (col. 2, lines 13-17, and col. 3, line 59 to col. 5, line 15), colorant has

difficulty in penetrating into the absorbent surface such as drawing paper (col. 2, lines 23-27), and the metallic pigment is preferably coated by the cellulose derivatives which are used together with the natural polysaccharide so that the cellulose derivatives can effectively act on the metallic powder pigment, whereby a carbonyl group and/or a hydroxl group of the cellulose derivatives acts on the metallic powder pigment and the hydrophilic characteristics of the metallic power pigment are increased. Thus, the intimacy (linkage) between the metallic powder pigment and the colorant becomes strong. As a result, the colorant is trapped or absorbed by the metallic powder pigment, and thus the absorption of the colorant into the absorbent surface is restrained (see col. 2, lines 28-39).

Thus, in Yoshimura a water-soluble soy polysaccharide or a water-soluble soy polysaccharide derivative is used in place of either a cellulose derivative such as methyl cellulose, CMC, etc., or a cyclodextrin/cyclodextrin derivative, both having hydroxyl groups, together with a natural polysaccharide (col. 2, line 64 to col. 3, line 11, col. 3, line 46 to col. 4, line 19, col. 5, lines 40-54, and col. 6, lines 15-34). It is thus quite unlikely that the water-soluble soy polysaccharide or water-soluble soy polysaccharide derivative per se would function as a coating or size for a substrate such as paper in accordance with the teaching in Yoshimura.

In more detail, a mandatory component for controlling color development in the aqueous ink composition of Yoshimura is not a water-soluble soy polysaccharide or water-soluble soy polysaccharide derivative but a natural polysaccharide (emphasis added). See Yoshimura at col. 2, lines 3-10. This means that the water-soluble soy polysaccharide or water-soluble polysaccharide derivative of Yoshimura cannot be used independently, but must be used

together with a natural polysaccharide selected from the group consisting of a microbial polysaccharide or derivatives thereof, or a water-soluble vegetable polysaccharide or derivatives thereof, or a water-soluble animal polysaccharide or derivatives thereof (emphasis added) (col. 4, lines 59-63). The Yoshimura aqueous metallic ink composition containing both a natural polysaccharide and a water-soluble soy polysaccharide or water-soluble polysaccharide derivative makes it difficult for the colorant to penetrate into a absorbent surface such as a drawing paper, whereby any decrease in density of color development at the ink film can be restrained (col. 3, line 62 to col. 4, line 1).

Thus, when a water-soluble soy polysaccharide or water-soluble soy polysaccharide derivative is used instead of a cellulose derivative together with a natural polysaccharide in the aqueous ink composition of Yoshimura, the metallic pigment is preferably coated by the water-soluble soy polysaccharide or water-soluble soy polysaccharide derivative, whereby the water-soluble soy polysaccharide or water-soluble soy polysaccharide derivative acts effectively on the metallic powder pigment. This is because the water-soluble soy polysaccharide or water-soluble soy polysaccharide derivative is easily absorbed in or links by hydrogen bonding to the surface of the metallic powder pigment and the surface of the colorant, whereby the water-soluble soy polysaccharide or water-soluble soy polysaccharide derivative attaches the colorant to the metallic powder pigment (col. 4, lines 1-7), acting as if the water-soluble soy polysaccharide or water-soluble soy polysaccharide derivative is a binder component for the metallic powder pigment and the colorant.

As a result, a writing area with a vivid metallic color can be obtained. The aqueous metallic ink composition of Yoshimura has the ability to restrain changes of viscosity and to maintain the stability of the Yoshimura ink composition with time if the water-soluble soy polysaccharide or water-soluble soy polysaccharide derivative is present (col. 4, lines 7-19).

The Examiner stated in the prior Office Action, Paper No. 6, Paragraph 5, lines 10-12 on page 2, that:

> "Patentee (the Examiner speaking of Yoshimura) discloses in col. 2, lines 23-27, that the polysaccharide (which may mean a water-soluble soy polysaccharide or a water-soluble soy polysaccharide derivative) is described as a coating or size for a substrate such as paper." (material in parenthesis added)

The Examiner states in paragraph 4, bridging pages 2/3 of the present Office Action, that:

> "Though the polysaccharide does not function as a sizing agent (as pointed out by Applicants on page 8), it can be a part or ingredient of a blend or a composition which can act as a sizing agent".

However, the Examiner's particular attention is directed to Yoshimura at col. 2, lines 23-27, where Yoshimura teaches as follows:

"The aqueous metallic ink composition of the invention comprises both the natural polysaccharide and cellulose derivatives so that the colorant has difficulty in penetrating into the absorbent surface (such as drawing paper). Applicants thus believe it quite clear that Yoshimura does not teach that such cellulose derivatives can function as a coating or size for a substrate such as paper that can be replaced with a water-soluble soy polysaccharide or water-soluble soy polysaccharide derivative.

Yoshimura clearly describes that:

"A feature of the aqueous metallic ink composition of the invention that contains the natural polysaccharide and cellulose is the combination of the natural polysaccharide and

cellulose derivatives. The combination is capable of preventing the colorant of the metallic ink composition from penetrating into the absorbent surface while preventing the fixability of the ink composition to the non-absorbent surface. Moreover, the dispersibility of the ink composition is excellent (see column 5, lines 31-39)."

It is essential for Yoshimura's ink composition to contain both a natural polysaccharide such as Xanthan gum and cellulose derivatives including methyl cellulose, CMC, or the like, which are interchangeable with the waters-soluble soy polysaccharide or water-soluble polysaccharide derivatives (see claim 1: column 4, lines 59 to column 5, line 7, and Table 1 on columns 15-16). Yoshimura fails to teach or suggest any aqueous metallic ink composition containing only cellulose derivatives such as water-soluble soy polysaccharide, water-soluble polysaccharide derivatives and mixture thereof.

In essence, Yoshimura simply discloses an aqueous metallic ink composition comprising at least a metallic power pigment, a colorant, water and a water-soluble organic solvent, and further including both a natural polysaccharide (mandatory) and in one embodiment a water-soluble soy polysaccharide or water-soluble soy polysaccharide derivative (optional), whereby the stability with time of the density of color development is increased and any change in viscosity of the ink is restrained or prevented (col. 3, lines 48-61). In this regard, the water-soluble soy polysaccharide or water-soluble soy polysaccharide derivative of Yoshimura is added as a binder component in the aqueous ink composition for the metallic powder pigment and the colorant, not for the colorant and the absorbent surface such as a drawing paper. Specifically, the function thereof is to enable the colorant to fix on the metallic powder pigment, particularly on an aluminum powder pigment, thereby restraining a viscosity change of the aqueous metallic ink composition caused by the natural polysaccharide so that stable viscosity is

insured (emphasis added) (col. 4, lines 7-19 and col. 6, lines 51-59, and especially note the disclosure at col. 6, lines 57/58 "restrain the viscosity change caused by the natural polysaccharide").

The rejection is, of course, a combination rejection, and Applicants now turn to JP '425. JP '425 is discussed in the specification of the present application at page 2. As can be seen, JP '425 discloses a plain paper for inkjet printing, coated with a coating composition liquid comprising as effective components an artificial cationic polymer and a water-soluble resin, where the artificial cationic polymer has the effective constituent of a polymerized substance consisting of the skeleton of a (meth)acrylamide alkylquarternary ammonium salt having a benzyl group to improve the water resistance of a picture on inkjet recording (see the English abstract attached hereto).

However, JP '425 is silent regarding a sizing agent containing a water-soluble soybean polysaccharide as an indispensable component for providing a recording paper comprising a sizing agent as such. Accordingly, Applicants respectfully submit that one of ordinary skill in the art, referring to JP '425, would not be motivated to reach the invention as set forth in claim 17 herein, and this would be the case even considering the multi component/complex quite distinct system of Yoshimura. Accordingly, claim 17 is believed patentable over the prior art.

Referring now to the Action of October 8, 2002 (unnumbered paper), in the paragraph bridging pages 2/3, the Examiner states as follows:

> "It would have been obvious to add to the composition of JP '425, the polysaccharide of Yoshimura with the expectation of (a) improving resistance of the composition (as a size) to water (b) to maintain the density of color by minimizing penetration of colorant particles into substrate such as paper and (c) to

> enhance stability of viscosity. It would also have been obvious to add surfactant for improving wetting."

However, as earlier explained, the indispensable component for controlling the color development in the aqueous ink composition of Yoshimura is not a water-soluble soy polysaccharide or water-soluble soy polysaccharide derivative, rather, the indispensable component is the natural polysaccharide of Yoshimura. Quite clearly, the water-soluble soy polysaccharide or water-soluble soy polysaccharide derivative of Yoshimura cannot be used independently, but must be used together, with a natural polysaccharide. Referring to Yoshimura at col. 3, line 62 to col. 4, line 1, Yoshimura teaches as follows:

> "This aqueous metallic ink composition contains both the natural polysaccharide and the water-soluble soy polysaccharide or water-soluble soy polysaccharide derivatives so that the colorant has difficulty in penetrating into the absorbent surface (such as a drawing paper) and the decrease of the density of the color development at the ink film can be restrained)."

Applicants thus submit it is quite clear that the water-soluble soy polysaccharide or water-soluble soy polysaccharide derivative of Yoshimura does not independently have the capability to function such that it would (a) improve the resistance of the composition (as a size) to water, (b) maintain the density of color by minimizing penetration of colorant particles into a substrate such as paper and (c) to enhance stability of viscosity. On this latter point, note Yoshimura at col. 6, lines 53/54, where the water-soluble soy polysaccharide or water-soluble soy polysaccharide derivative simply restrains the viscosity change caused by the natural polysaccharide so as to ensure viscosity stability.

Since Yoshimura thus does not teach or suggest a recording paper impregnated with a sizing agent comprising a water-soluble soybean polysaccharide and a cationic polymer, and for

the reasons earlier discussed with respect to JP '425, the combination of references, it is respectfully submitted, does not lead one of ordinary skill in the art to the present invention, since there is no motivation to form a product as called for in claim 17.

Applicants would like to clarify the features of a recording paper prepared by a method according to the present invention over a conventional recording paper. They attach hereto a paper entitled "SET SET-107" for the present invention and a conventional "PPC paper". Each was printed by using a printer "Canon S630" under the same printing conditions. As can be seen, the sample "SET SET-107" is far superior to "PPC paper" in Ink Fixation, Feathering (a bleeding test) and Water Resistance.

Withdrawal of the art rejection and allowance is requested.

Respectfully submitted,

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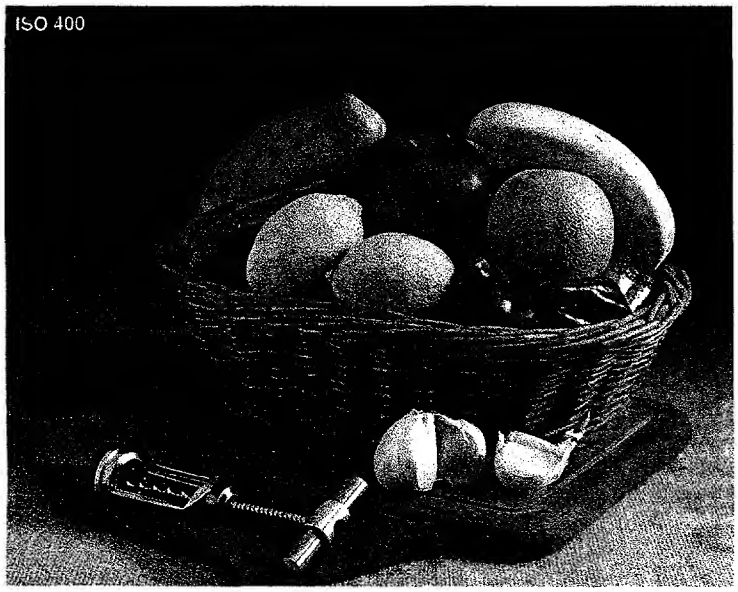
Date: July 24, 2003

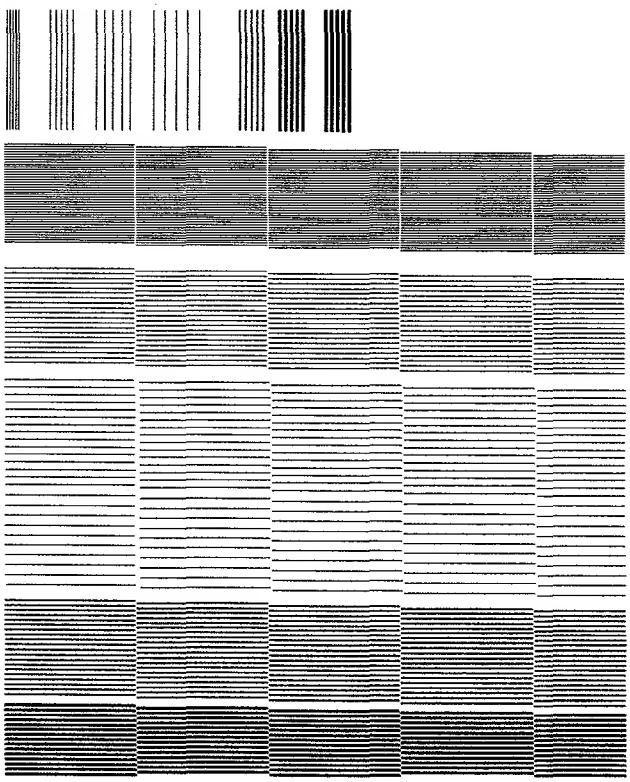
Printer : CANON S630
Paper : SET SET-107-64g/㎡

1. 発色 (Color)



2. 定着 (Ink Fixation)

3. にじみ評価用印刷 (Feathering)



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4. 耐水性確認用印刷 (Water Resistance)